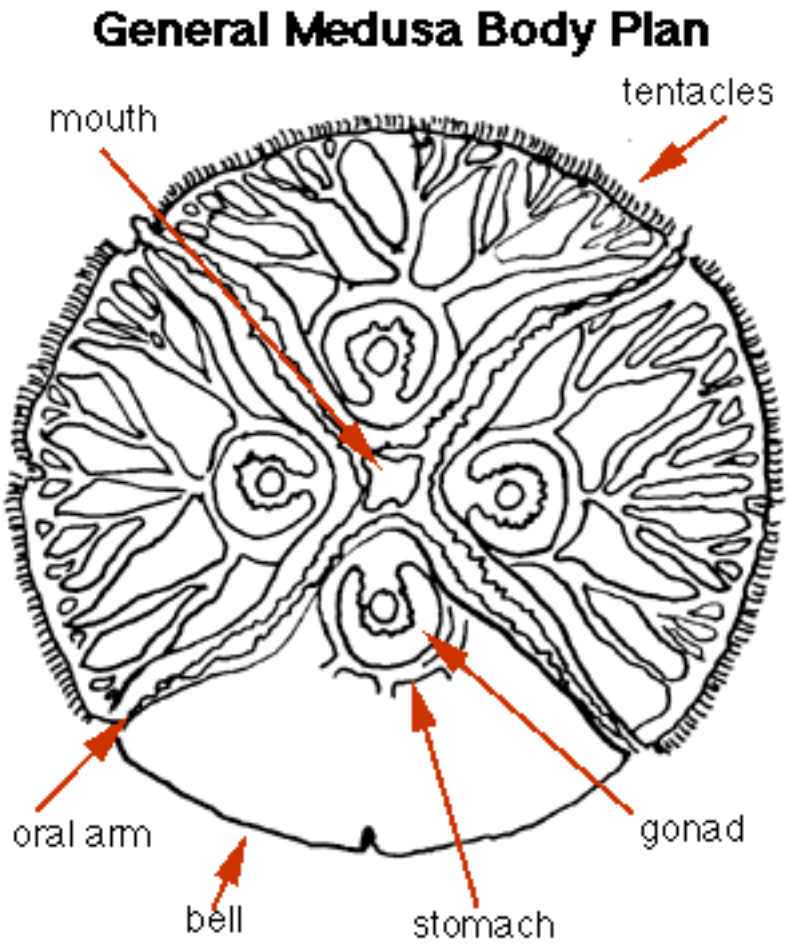
Jellyfish

Few marine creatures are as mysterious and intimidating as jellyfish. Though easily recognized, this animal is often misunderstood. Bathers and beachcombers react with fear upon encountering this invertebrate but, in fact, most jellyfish in South Carolina waters are harmless.

Jellyfish are members of the phylum Cnidaria. Members of this structurally simple marine group possess one of two body forms. Sea anemones, sea whips, corals and hydroids are polyps growing attached to rocks or other hard surfaces of the sea. Jellyfish and the Portuguese man-of- war are free-swimming medusae. Both body forms display radial symmetry with body parts radiating from a central axis. This symmetry allows jellyfish to respond to food or danger from any direction.



Instead of a brain, "true" jellyfish possess an elementary nervous system, or nerve net, which consists of receptors capable of detecting light, odor and other stimuli and coordinating appropriate responses.

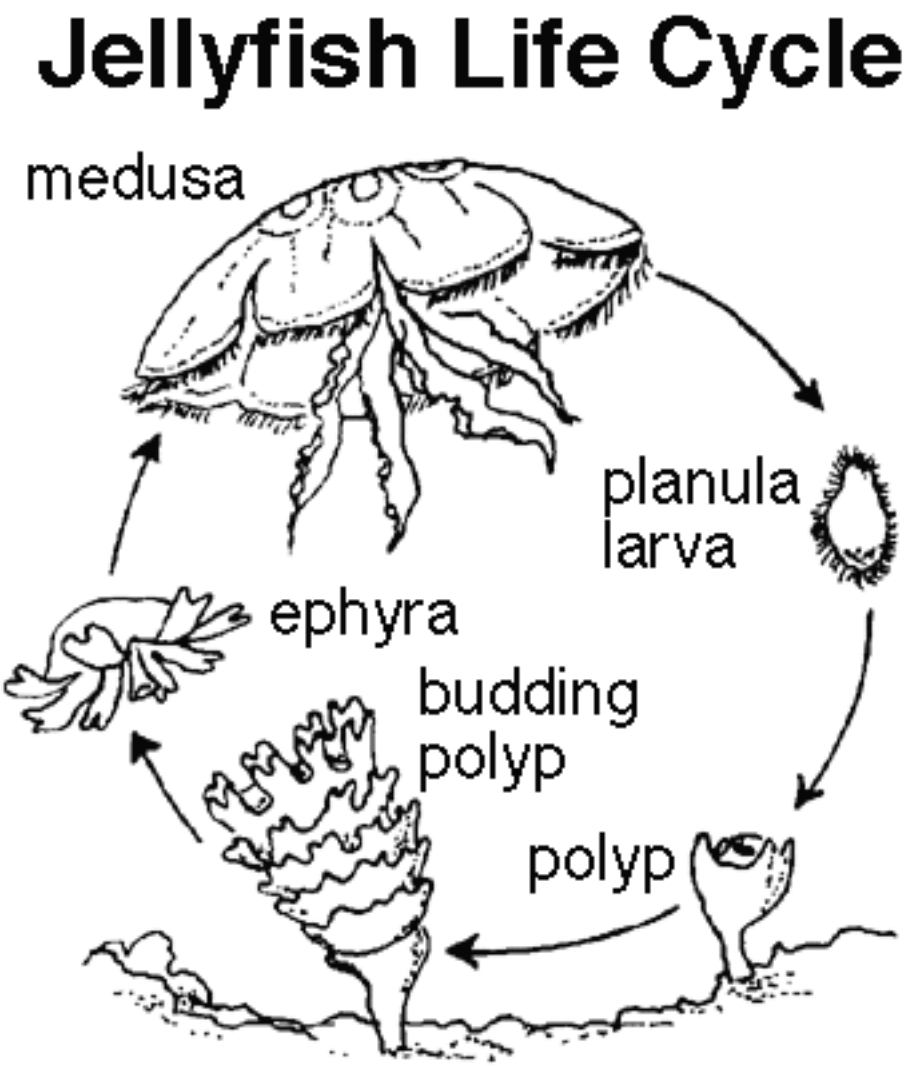
Jellyfish are composed of an outer layer (epidermis) which covers the external body surface and an inner layer (gastrodermis) which lines the gut. Between the epidermis and gastrodermis is a layer of thick elastic jellylike substance called mesoglea ("middle jelly"). Jellyfish have a simple digestivecavity (coelenteron) which acts as a gullet, stomach and intestine with one opening for the mouth and anus. Four to eight oral arms are located near the mouth and are used to transport food that has been captured by the tentacles.

Jellyfish occur in a wide variety of sizes, shapes and colors. Most are semi-transparent or glassy and bell-shaped, measuring less than an inch to over a foot across the bell, although some may reach 7 feet. The tentacles of some jellyfish can reach lengths greater than 100 feet. Regardless of their size or shape, most jellyfish are very fragile, often containing less than 5% solid organic matter.

Jellyfish inhabit every major oceanic area of the world and are capable of withstanding a wide range of temperatures and salinities. Most live in shallow coastal waters, but a few inhabit depths of 12,000 feet!

Life Cycles

The life cycle of a typical jellyfish involves an alteration of generations in which the animal passes through two different body forms. The dominant and conspicuous medusa is the familiar form, while the smaller polyp form is restricted to the larval stage. Jellyfish are either male or female and



reproduce sexually. The reproductive organs (gonads) develop in the lining of the gut. During reproduction, the male releases sperm through its mouth into the water column. The sperm swims into the mouth of the female where fertilizationoccurs. Early embryonic development begins either inside the female or in brood pouches along the oral arms. Small swimming larvae (planula) leave the mouth or brood pouches and enter the water column. The larvae then seek a shaded surface and attach to the bottom, forming polyps. These polyps divide and bud into young jellyfish (ephyra). In a few weeks, an ephyra will grow into an adult medusa, thus completing the complex life cycle. Jellyfish normally live three to six months.

Locomotion

The adult jellyfish drifts in the water with limited control over its movements. It is, however, endowed with muscles that allow it to contract its bell, reducing the space under it, forcing water out through the opening. This pulsating rhythm allows for some regulation of vertical movement. Because jellyfish are sensitive to light, this vertical movement can be important. Some jellyfish, like the sea wasp, descend to deeper waters during the bright sun of the midday and surface during early morning, late afternoon and evenings. Despite this ability to move vertically, jellyfish depend upon ocean currents, tides and wind for horizontal movement.

Food

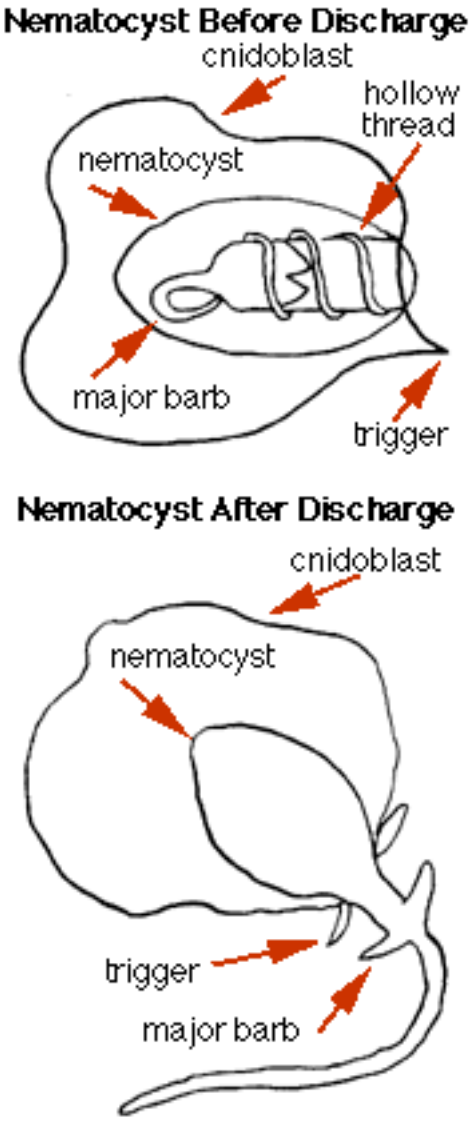
Jellyfish may appear to have no apparent value, but they are, in fact, a very important part of the marine food web. Jellyfish are carnivorous, feeding mostly on a variety of zooplankton, comb jellies and occasionally other jellyfish. Larger species, however, are capable of capturing and devouring large crustaceans and other marine organisms. Jellyfish themselves are preyed upon by spadefish, sunfish, loggerhead turtles and other marine organisms. One species, the mushroom jelly, is even

considered a delicacy by humans. Both fresh and pickled mushroom jellyfish are consumed in large quantities in China and Japan.

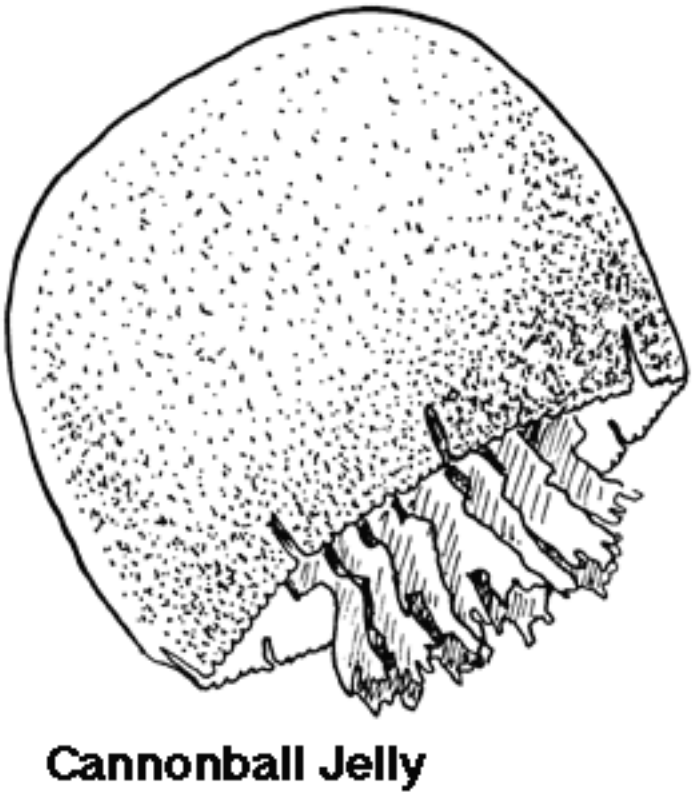
Venom Apparatus

Jellyfish are equipped with a specialized venom apparatus (cnidoblast) for defense and feeding. A capsule (nematocyst) inside the cnidoblast contains a trigger and a stinging structure. The stinging structure varies according to species, but generally consists of a hollow coiled thread with barbs lining its surface. Nematocysts are concentrated on the tentacles or oral arms. A single tentacle can have hundreds or thousands of nematocysts embedded in the epidermis. Triggers of nematocysts are activated when contact is made with another object. Pressure within the nematocyst forces the stinging thread to rapidly uncoil. The thousands of nematocysts act as small harpoons, firing into prey, injecting paralyzing toxins. Stings usually paralyze or kill only small creatures but some jellyfish are harmful to humans. Jellyfish do not "attack" humans. Stings occur when swimmers or beachcombers come in contact with nematocysts. Severity of stings depends on the species of jellyfish, the penetrating power of the nematocyst, the thickness of exposed skin of the victim and the sensitivity of the victim to the venom. The majority of stings from jellyfish occur in tropical and warm temperate waters. Most species off the southeastern coast are capable of inflicting only mild stings resulting in minor discomfort.

Local Jellyfish



Although most jellyfish that inhabit South Carolina waters are harmless to humans, there are a few, like the sea wasp, that require caution. Learning how to identify the different species can help you decide which ones can be safely ignored.


Cannonball Jelly

Cannonball Jelly (*Stomolophus meleagris*)

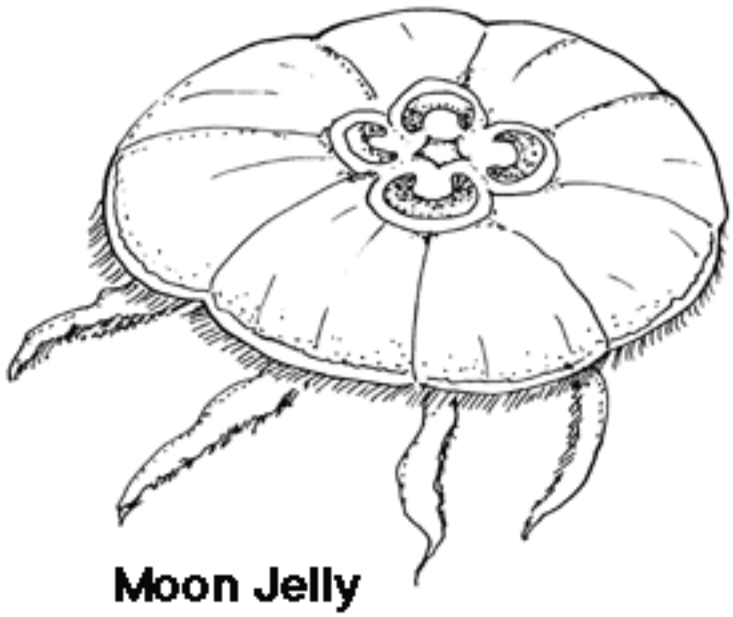
Also know as jellyballs, these jellyfish are the most common in our area. During the summer and fall, large numbers of *Stomolophus* appear near the coast and in the months of estuaries. They are considered to be pests by commercial trawl fishermen because they clog and damage nets and slow sorting and trawl times. Fortunately, while the cannonball is the most abundant jellyfish in the area, it is also one of the least venomous. Cannonballs can be identified by their hemispherical white bells decorated with rich, chocolate brown bands. They have no tentacle but a gristle-like feeding apparatus formed by the joining of the oral arms. Cannonballs rarely grow larger than 8 inches in diameter.

Mushroom Jelly (*Rhopilema verrilli*)

The mushroom jelly is often mistaken for the cannonball jelly, but it differs in many ways. The larger mushroom jelly, growing to 20 inches in diameter, lacks the brown bands associated with the cannonball and is much flatter and softer. Like the cannonball, the mushroom has no tentacles, however, it possesses long finger-like appendages hanging from the feeding apparatus. The mushroom jelly does not represent a hazard to humans.

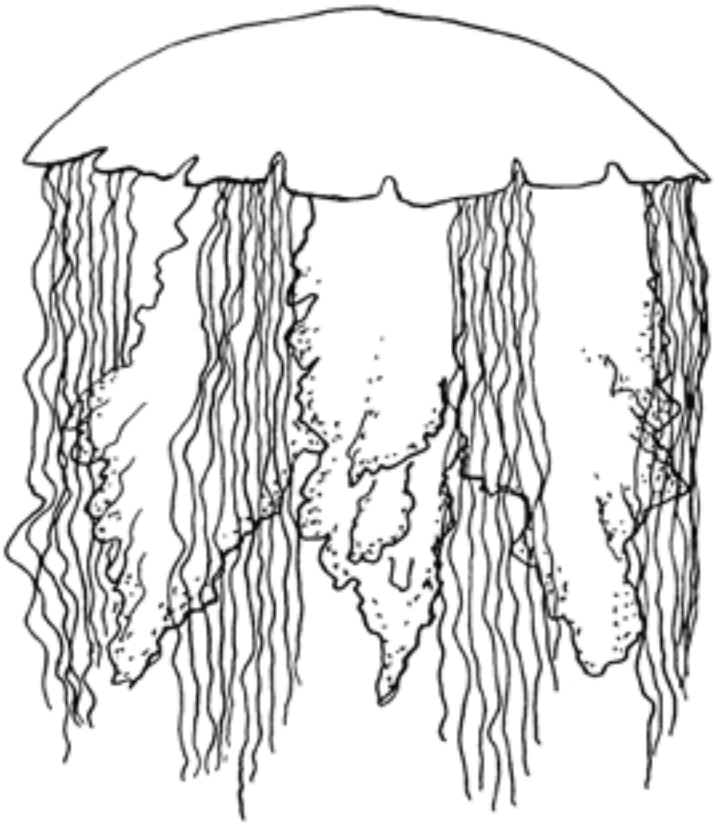
Moon Jelly
(*Aurelia aurita*)

Probably the most widely recognized jellyfish, the moon jelly is relatively infrequent in South Carolina waters. It has a transparent, saucer-shaped bell and is easily identified by the four pink horseshoe-shaped gonads visible through the bell. It typically reaches 6-8 inches in diameter, but some are known to exceed 20 inches. The moon jelly is only slightly venomous. Contact can produce symptoms from immediate prickly sensations to mild burning. Pain is usually restricted to immediate area of contact.



Lion's Mane
(*Cyanea capillata*)

Also know as the winter jelly, the lion's mane typically appears during colder months of the year. The bell, measuring 6-8 inches, is saucer-shaped with reddish brown oral arms and eight clusters of tentacles hanging underneath. *Cyanea* are generally considered moderate stingers. Symptoms are similar to those of the moon jelly, however, usually more intense. Pain is relatively mild and often described as burning rather than stinging.



Lion's Mane

Sea Nettle
(*Chrysaora quinquecirrha*)

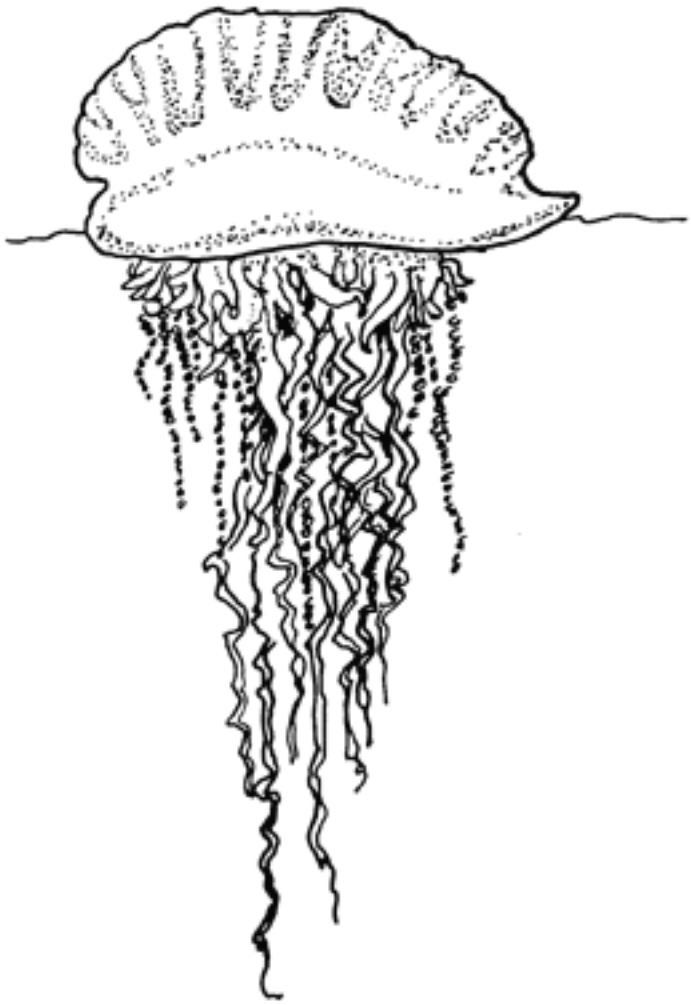
The sea nettle is frequently observed in South Carolina waters during summer months. This jellyfish is saucer- shaped with brown or red pigments, usually 6-8 inches in diameter. Four oral arms and long marginal tentacles hang from the bell. Considered moderate to severe, symptoms from sea nettle stings are similar to those of the lion's mane.

Sea Wasp
(*Chiropsalmus quadrumanus*)

Known as the box jelly because of its cube-shaped bell, the sea wasp is the most venomous jellyfish inhabiting our waters. Their potent sting can cause severe dermatitis and may even require hospitalization. Sea wasps are strong, graceful swimmers reaching 5-6 inches in diameter and 4-6 inches in height. Several long tentacles hang from the four corners of the cube. A similar species, the four-tentacled*Tamoya haplonema*, also occurs in our waters.

Portuguese Man-of-War (*Physalia physalis*)

Although a member of the phylum Cnidaria, the Portuguese man-of-war is not a "true" jellyfish. These animals consist of a complex colony of individual members, including a float, modified feeding polyps and reproductive medusae. *Physalia* typically inhabit the warm waters of the tropics, sub-tropics and Gulf Stream. Propelled by wind and ocean currents, they sometimes drift into nearshore waters of South Carolina. Though they infrequently visit our coast, swimmers should learn to identify these highly venomous creatures. The gas-filled float of the man-of-war is purple-blue and can reach lengths of 12 inches. Under thefloat, tentacles equipped with thousands of nematocysts hang from the feeding polyps extending up to 65 feet.



Portuguese Man-of-War

The man-of-war can inflict extremely painful stings. Symptoms include severe shooting pain described as a shocklike sensation, and intense joint and muscle pain. Pain may be accompanied by headaches, shock, collapse, faintness, hysteria, chills, fever, nausea and vomiting. Initial contact with *Physalia* may result in only a small number of stings. However, efforts to escape from the tentacles may further discharge nematocysts and intensify stings. Care should be taken when removing the adhering tentacles. Severe stings can occur even when the animal is beached or dead.

Treatment of Sting

Primary first aid for any jellyfish sting should be to minimize the number of nematocysts discharging into the skin and to reduce the harmful effects of the venom. If stung by a jellyfish, the victim should carefully remove the tentacles that adhere to the skin by using sand, clothing, towels, seaweed or other available materials. As long as tentacles remain on the skin, they will continue to discharge venom.

A variety of substances have been used to reduce the effects of jellyfish stings. Meat tenderizer, sugar, vinegar, plant juices and sodium bicarbonate have all been used with varying degrees of success. Methylated spirits and other forms of alcohol formerly recommended for inhibiting stinging cells actually stimulate them and may increase pain and cause severe skin reactions. Picric acid and

human urine also cause a discharge of nematocysts and should not be used. Victims of serious stings should make every effort to get out of the water as soon as possible to avoid drowning. If swelling and pain from more serious stings persists, prompt medical attention should be sought. Recovery periods can vary from several minutes to several weeks.

Prevention

Care should be taken when swimming in areas where dangerous jellies are known to exist or when an abundance of jellies of any type is present. Keep in mind that tentacles of some species may trail a great distance from the body of the organism and should be given lots of room. Stings, resulting from remnants of damaged tentacles, can occur in waters after heavy storms. Rubber skindiving suits offer protection against most contact.

Be careful when investigating jellyfish that have washed ashore. Although they may be dead, they may still be capable of inflicting stings. Remember to take precautions when removing tentacles after contact or additional stings may result.

DNR Mission Statement

The South Carolina Department of Natural Resources is the advocate for and steward of the state's natural resources. The Department of Natural Resources develops and implements policies and programs for the conservation, management, utilization, and protection of the state's natural resources based upon scientifically sound resource assessment and monitoring, applied research, technology transfer, comprehensive planning, public education, technical assistance and constituent involvement. The Department of Natural Resources is pro-active in protecting the state's natural resources for use and enjoyment by future generations of South Carolinians.

Saltwater Fishing
Conservation & Ethics

Although most people once considered ocean resources to be unlimited, recent rapid declines in the populations of many commercial and recreational species have demonstrated the opposite. Numerous types of saltwater game fish now are being over harvested and other species will face a similar fate unless all anglers practice wise conservation and adopt an ethical approach to fishing. Size and catch limits, seasons and gear restrictions should be adhered to strictly. These regulations change from time to time as managers learn more about fish life histories and how to provide angling opportunities without depleting stocks.

The challenge of catching, not killing fish, provides anglers with the excitement and the reward of fishing. Undersized fish, or fish over the limit should be released to ensure the future of fish populations. The number of saltwater finfish tagged and released annually in South Carolina has increased significantly in recent years as more and more fishermen take up this practice that provides information on growth and movement of fish as well as conserving resources.

Saltwater fishermen can further contribute to conservation by purchasing a Marine Recreational Fisheries Stamp which is required to fish from a private boat or gather shellfish in South Carolina's saltwaters. Funds generated by the sale of stamps must be spent on programs that directly benefit

saltwater fish, shellfish and fishermen.

Special Note

This publication was made possible in part with funds from the sale of the South Carolina Marine Recreational Fisheries Stamp. Help ensure outdoor enjoyment for future generations by strictly adhering to all rules, regulations, seasons, catch limits and size limits. The South Carolina Department of Natural Resources publishes an annual Rules and Regulations booklet that lists all saltwater fishing regulations. Have an enjoyable fishing trip by reading these requirements before you fish.

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